EFFECT OF PERSUASIVE TECHNOLOGY EMBEDDED DIGITAL PLATFORM ON THE ATTITUDE AND INTEREST OF SECONDARY SCHOOL STUDENTS TOWARDS MATHEMATICS LEARNING

A

SYNOPSIS

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1.0.0 INTRODUCTION

In the recent time, the appearance of technologies has caused enormous changes and innovations in human's life, working style, communications, lifestyle, education and so on. These technological changes have provided the opportunities to enhance the learning processes by the way of appropriate utilization of learning theories.

Persuasion is human communication designed to influence the autonomous judgments and actions. Web, Internet, mobile, virtual environment and other ambient technologies generate opportunities for persuasive interaction through technology, because through these users can be reached easily and the technologies are able to combine the positive attributes of interpersonal and mass communication. The interactive nature of computer technology that allows designers to use computer as a persuasive tool to modify human behavior is known as persuasive technology (PT).

B.J. Fogg(2003) stated that *Persuasive technology is all about computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception*. Nowadays, one of the essential skills for teachers and trainers is persuasive technological pedagogy, which enables them to help learners for developing their skills and abilities (Bacon, 2011). Perloff (2010) believed that persuasion is a process which attempts to change attitude in free atmosphere. B.J. Fogg(2003) in his book, *Persuasive Technology: Using Computers to Change what We Think and Do*, also describes that persuasive technology can change people's lives in three related ways based on the functional role or how user respond to the computer system, which are; computer as a tool, as a medium and as a social actor(Dolhalit, M. L. B., Salam et al., 2016).

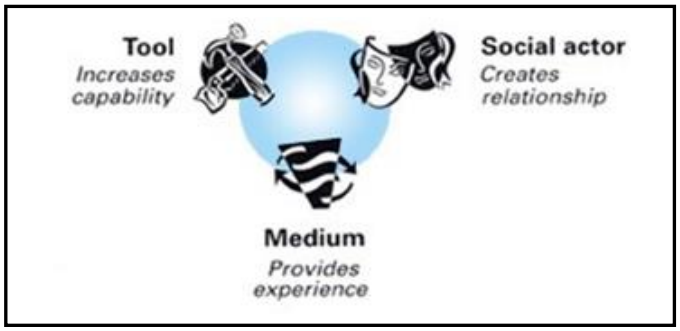

Fig 1.1 : Three dimensions of PT defined by Fogg(2003)

(Source: Dolhalit, M. L. B., Salam,et al. (2016). A Review on Persuasive Technology (PT) Strategy in Awareness Study. *Indian Journal of Science and Technology*, *9*(34).doi: 10.17485/ijst/2016/v9i34/100826)

As a tool, interactive computing technologies can be persuasive by making target behavior easier, leading people through a process, or performing calculations/measurements that motivate. As a medium, interactive technologies can be persuasive by allowing people to explore cause-and effect relationships, providing people with experiences that motivate, or helping people to rehearse a behavior.

As a social actor, interactive computing technologies can be persuasive by rewarding people with positive feedback, modeling a target behavior or attitude, and providing a social network of support. This unique potential use of persuasive computers generates or increases interest in the teaching-learning process. The overlapping area of study between persuasion and computing technologies and derived a term known as 'catalog' or Computers as Persuasive Technology(Dolhalit, M. L. B., Salam et al., 2016).

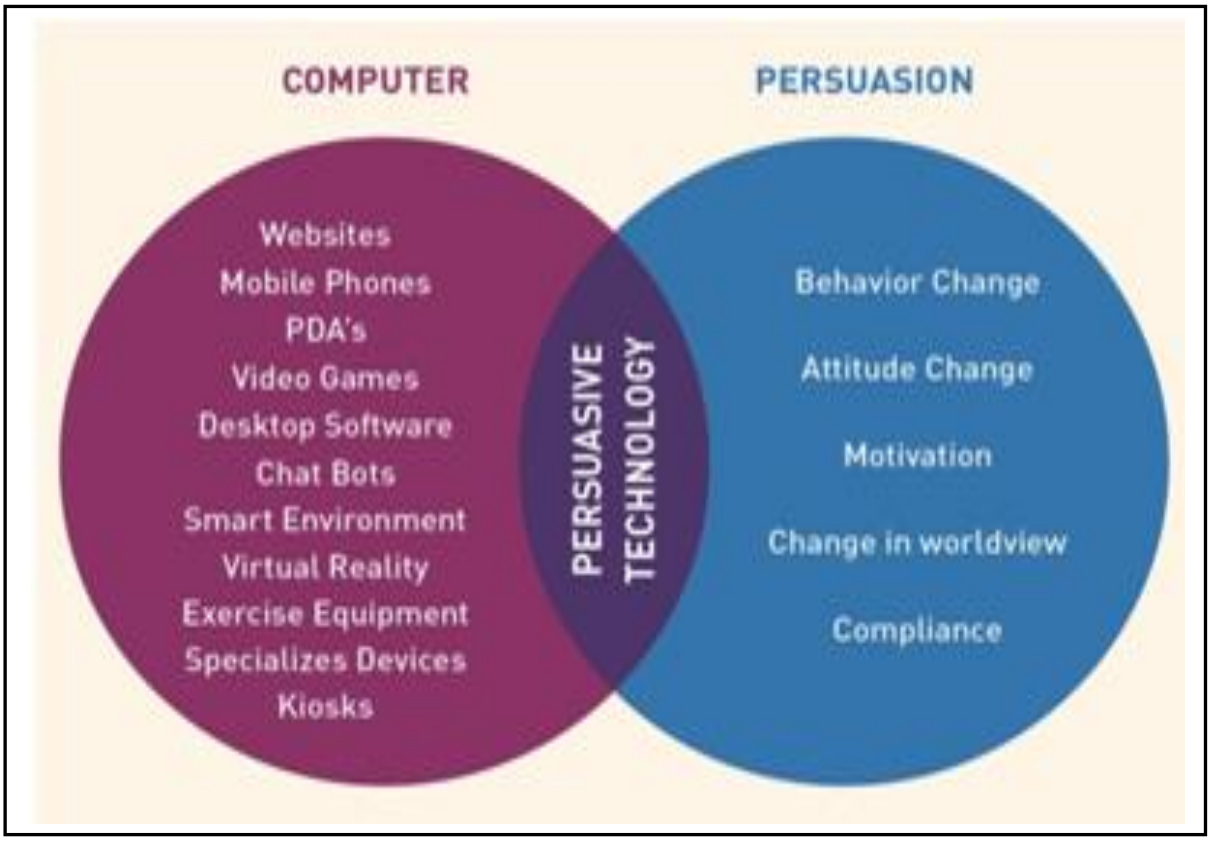

Fig 1.2 : Computers as Persuasive Technology

(Source: Dolhalit, M. L. B., Salam,et. al. (2016). A Review on Persuasive Technology (PT) Strategy in Awareness Study. *Indian Journal of Science and Technology*, *9*(34). doi: 10.17485/ijst/2016/ v9i3 4/100826**)**

With proper instructional material and the execution of that instructional material, learning can be more effective and successful. As a result, learners will utilize technology capabilities in the learning process decisively and they will be able to improve their academic performance.

The use of appropriate interactive technology can enhance learner's cognitive and social abilities (Dolhalit, Salam, Mutalib,2016). This technology also attracts the learner's attention in term of meaningful learning, self-explored and retention in understanding.

The purpose of this study is to removing the negative attitude of students towards mathematics and developing a positive attitude towards mathematics learning. This study will also focus on developing the interest of students in mathematics. WEB 2.0 and Mobile learning will be used as persuasive technology in order to reach the desired change in their attitude and interest.

1.1.0 PERSUASION

Persuasion is a social phenomena than can occur when there are connections and communications between two or more people. Communications made between two or more people are not only of information, but also values, attitudes, and behaviors.

According to B.J. Fogg(2009), Persuasion is a human communication designed to influence independent judgments and actions of others. Today technology takes part in the communications made by human to human.

The Web, the Internet, mobile application and other medium technologies generate opportunities for persuasive interaction because users can be reached easily and the technologies can combine the positive attributes of interpersonal and mass communications.

Researchers have defined persuasion in various ways. Although there are different definitions for persuasion (Andersen, 1971; Bettinghaus & Cody, 1987; O'Keefe, 1990; Smith, 1982), perhaps Perloff definition is a succinct explanation:'*a symbolic processes in which communicators try to convince other people to change their attitudes or behavior, regarding an issue through the transmission of a message in an atmosphere of free choices*' (Perloff, 2010).The persuasion process represents a conscious attempt to influence others' attitude, behavior or both (Goode & Ben- Yehuda, 2010).

1.2.0 PERSUASION IN EDUCATION

Persuasion is very ancient in education. It was always present there in the form of influence, motivation and behavior modification. In education, persuasion is a process aimed at changing students' beliefs, attitude or behaviour toward some event, idea, object, or other person(s), by using written, spoken words or audio-visual tools or through some technology to convey information, feelings, or reasoning, or a combination thereof.

The school's atmosphere, its traditions, the curriculum itself, and the methods and techniques used to teach curriculum are all imminently persuasive. High-poverty schools that set high academic standards are persuading children that they can learn and that they have a future. Schools in which teachers and administrators are in and out of one another's classrooms, critiquing and challenging one another to improve, persuade children that lifelong learning is not only possible but desirable and that excellence is something to be taken seriously. Religious schools that encourage back-and-forth in the classroom persuade students that love, honesty, co-operation, truthfulness, emotional maturity and spirituality are important aspects of the moral life.

In this process of persuasion conditioning plays a very important role. It is about leading someone for taking certain actions of their own, rather than giving direct commands. In the previous time, teachers use communication as a persuasive tool to persuade students, but nowadays various technologies are also merged in this process of persuasion which help the teachers to achieve their goals and objectives and to persuade students in the right kind of direction.

The cognitive process of persuasion through communication is not new as Aristotle (4th BC) in his book, *The Art of Rhetoric*, equated communication to persuasion. As the teachers persuade students through communication or influence students' beliefs or actions through their communication , it can be written, visual, and verbal or any combination of these form used.

A teacher can have good knowledge about his/her subject but it is not necessary that he/she will be a good communicator also. Without a proper communications strategy, the teacher that addresses students' concerns, offers solutions, and does both of those things clearly and concisely—it is almost impossible to lead students in that direction as the teacher is thinking. Now in the 21st century, various

educational technologies are also involved in the process of persuasion, which can be used to influence student's beliefs, attitudes, motivation and behaviors.

1.3.0 PERSUASIVE TECHNOLOGY IN THE CLASSROOM

The introduction of this "new" technology in the classroom introduces new opportunities for education. The use of appropriate interactive technology can enhance learner's cognitive and social abilities. This technology also attracts the learner's attention in term of meaningful learning, self-explored and retention in content understanding thus helps learners to integrate information more efficiently.

According to B.J. Fogg(2002), Persuasive Technologies can be used at school or external environments to motivate people to acquire new knowledge or skills. In addition, Persuasive Technologies(PTs) can motivate individuals to start a certain process of learning, task completion, review when necessary materials as well as to continue the particular activity. In this way systems can be developed to assist in the learning process, providing teaching people at any time and space.

1.4.0 PARADIGMS OF LEARNING AND TEACHING – WHERE DOES PERSUASIVE TECHNOLOGY(PT) FIT?

The literature on professional thinking (Schön 1983) and on teacher thinking in particular (Brown and Macintyre 1994, Nias 1989, Calderhead 1991) indicates that at least to some extent the decisions that teachers make in the classroom about what particular teaching strategy or activity to adopt, are influenced by particular paradigms of teaching and learning extant in the minds of teachers. Paradigms of teaching explain how education should be conceptualised, how different tools or methods can be used and give suggestions for good practice. This theory may influence teachers explicitly (for example through theoretical structures adopted during initial training or subsequent professional development), or implicitly where its influence on structures and discourses within educational systems is reflected in teacher practice. Hennessy et al (2003) and Sandholz et al (1997)), indicated that encountering new technology requires teachers consider how they will assimilate the innovation in to their practice, and thus in to the existing paradigms of teaching and learning that influence that teaching practice.

1.5.0 WEB 2.0

The Web 2.0 technology is the second generation of web technologies that is more active and participative (Alqahtani H.F. and A. S. Alwadain, 2015). According to McAfee A.(2009), the Web 2.0 technology is a social software platform that can drive the group in achieving its goals.

Web 2.0 websites allow users to interact, communicate, create content and share information with one another through communities, social networks and virtual worlds in a way that is easier than ever. The development of Web 2.0 technology encourages the latest e-learning communicative online learning system (Gavin et al., 2014). Some examples of Web 2.0 based technologies are application blogs, social media, YouTube and others (Newman, Chang, Walters, & Wills, 2016).

Communication and interaction activities carried out with Web 2.0 technology would provide an opportunity to be developed into persuasion technology that can shape and improve existing behavior. Web 2.0 provides the following features to its users :

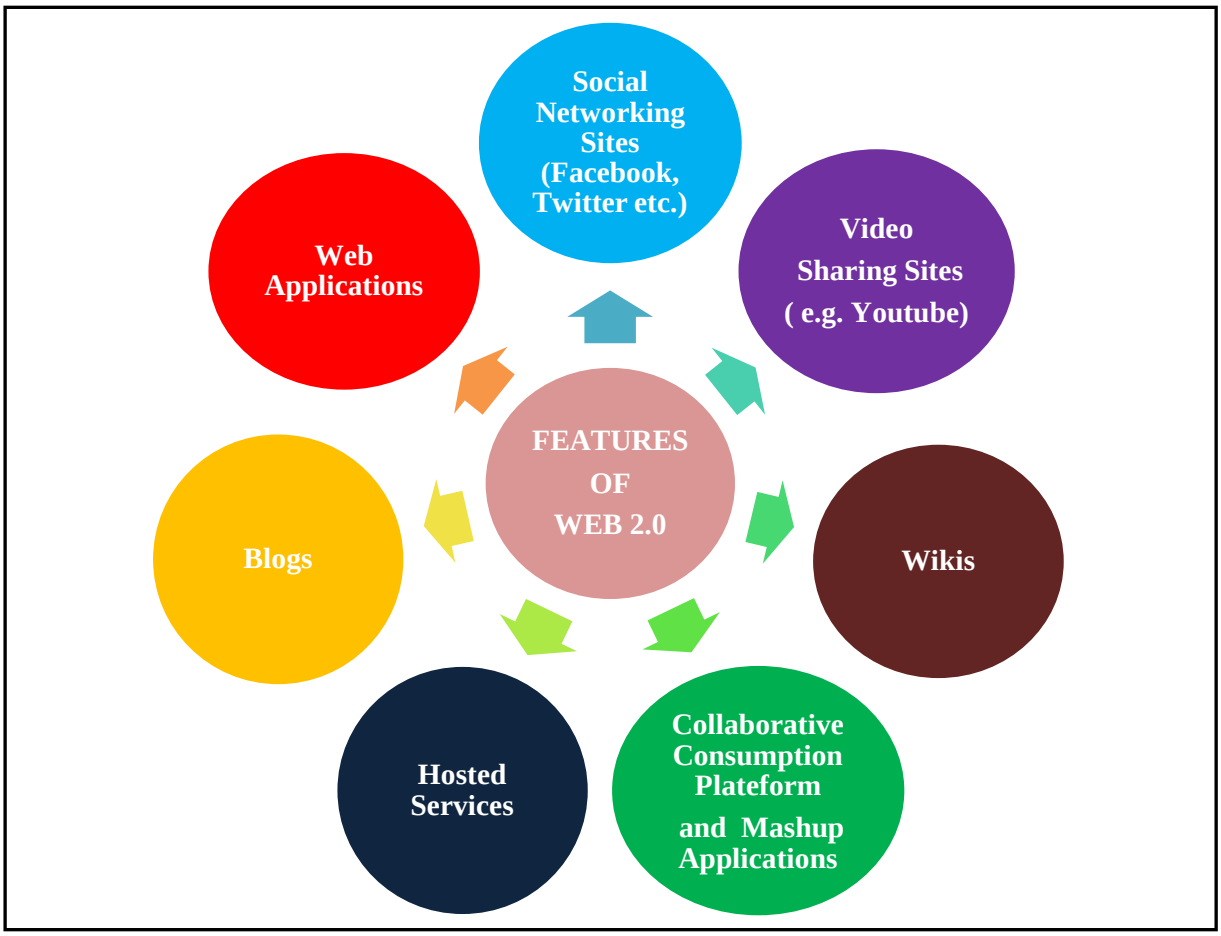

Fig 1.3 : Features of WEB 2.0

1.6.0. MOBILE LEARNING

Mobile Learning-learning or M- learning is learning across multiple contexts, through social and content interactions, using personal electronic devices. Mobile learning is education via the Internet or network using personal mobile devices, such as tablets and smart phones to obtain learning materials through mobile apps, social interactions and online educational hubs. It is flexible, allowing students access to education anywhere, anytime.

Mobile learning provides a way for educational institutions to deliver knowledge and educational content to students on any platform, anyplace and at the time of need. Students use mobile apps and tools to complete and upload assignments to teachers, download course instruction and work in online social groups to complete tasks. Mobile Learning has the following characteristics:

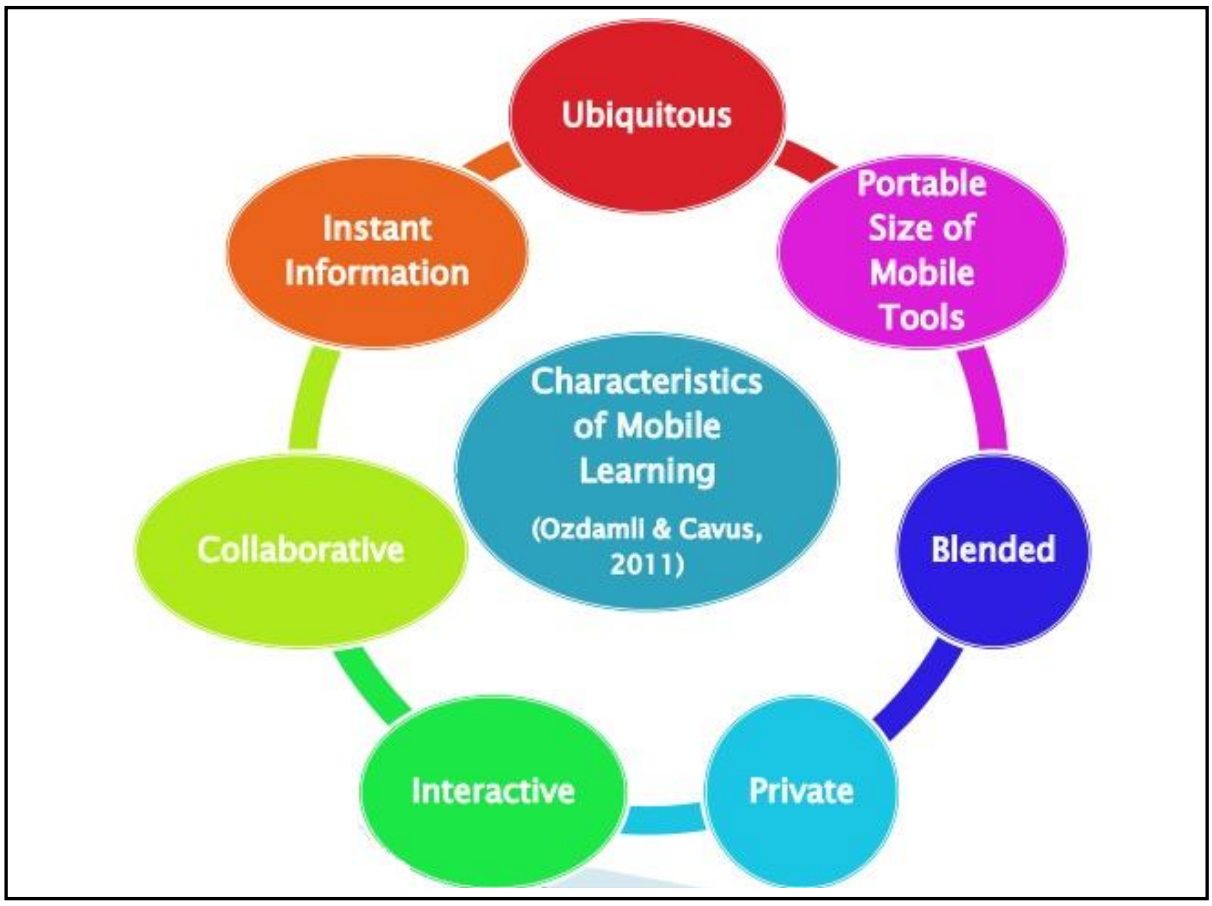

Fig 1.4: Characterstics of Mobile Learning

(**Source:** https://www.slideshare.net/fedile/modeling-mobile-learning-adoption-factors-in-higher-education-using-resource-based-theory-a-conceptual-framework)

2.0 EMERGENCE AND JUSTIFICATION OF THE STUDY

The emergence of persuasive technology theories started with the development of intentionality theory. This theory was introduced by Fogg in 1998; in his opinion, only persuasion implying an intent to change behaviours and attitudes can be considered a true persuasion. As a result, Fogg defines three types of intents: endogenous, exogenous, and autogenous. Endogenous intent means the persuasion is created through the designer of the system, and the purpose of the designed technology is to persuade its users. Exogenous intent is described by a person who gives to another person the persuasive technology in order to change that person's behaviour. Autogenous intent is defined by a person who chooses the persuasive system on their own initiative in order to change their very own behaviour.

In addition, Fogg also defines three categories that can be used to classify persuasive system. This system can function as tools, as media, or as social actors. As a tool, a system's focus is on providing capabilities to perform various tasks, in the simplest way; as medium, a system is able to provide enhanced experiences; as social actor, system emphasises the interactivity between the human and the technology.

Persuasive Technology resides outside of a defining social context and research and empirical research have paid attention to persuasive effects rather than studying and using the social context. Harri Oinas-Kukkonen (2008) argues that 3 types of persuasion can be identified: (i) Human-Human Persuasion (ii) Computer-Human persuasion and (iii) Human-Computer mediated-Human persuasion. The relationship between these types of persuasion depends on an analysis of the concrete social context. This is often lacking in considerations of persuasive technology design.

In an educational context the social context is crucial, and defines important properties of the persuasion. First of all Computer-Human persuasion is initiated by humans (i.e. teachers) and orchestrated by human-human persuasion and does not reside outside the social context. Rather the influence of the social context is often formalised in education plans developed in advance by teachers Furthermore the persuasion takes place in a power-relation, or as Harri Oinas-Kukkonen (2008) states it: 'Information is not neutral'. Motivation is not only an internal state of mind but also a question of understanding what correct behaviour is, which is largely defined by the social context created by the teacher. The educational context is one in which there exist explicitly expressed educational goals.

Table1.1 Exhibiting Some Studies Related to Persuasive Technology

S.No.	Year	Researcher	Title
1.	2019	Aisha Muhammad Abdullahi1, Rita Orji & Joshua C. Nwokeji	Personalizing Persuasive Educational Technologies to Learners' Cognitive Ability
2.	2019	Yohana Dewi Lulu Widyasari, Lukito Edi Nugroho and Adhistya Erna Permanasari	Persuasive technology for enhanced learning behavior in higher education
3.	2018	W. Nooraishya,W. Ahmad & N. M. Ali	The Impact Of Persuasive Technology On User Emotional Experience And User Experience Over Time
4.	2017	Yang-Wai Chow, Willy Susilo, et. al.	Video Games and Virtual Reality as Persuasive Technologies for Health Care: An Overview
5.	2017	A. Harris, Saif u Islam, J. Qadir, U. A. Khan	Persuasive Technology For Human Development: Review and Case Study
6.	2016	S. Devincenzi, Kweckoz et.al.	Persuasive Technology: Applications in education
7.	2016	A. Toor	Persuasive Technology in Education: Motivating Individuals to Enter Higher Education. doi: 10.14236/ewic/hci2016.15
8.	2013	A. G. Baharuddin Aris , M. H. Ahmad, M.S. Rosli	Technological Persuasive Pedagogy: A New Way to Persuade Students in the Computer-based Mathematics Learning
9.	2012	Rik Janssen	Persuasive technology to support self-directed learning in adult learning programs
10.	2009	SAMIR CHATTERJEE	Healthy Living with Persuasive Technologies: Framework, Issues and Challenges
11.	2006	A. Lucero, R. Zuloaga, S. Mota, and F. Muñoz	Persuasive Technologies in Education: Improving Motivation to Read and Write for Children

The research on persuasive technology started from 1997 onwards when researchers from the human-computer-interaction domain came up with the term 'captology' which stands for 'Computers as persuasive technologies' (Cheng, 2003). Captology is defined by Oinas- Kukkonen and Harjumaa (2008) as 'computerized software or information systems designed to reinforce, change or shape attitudes or behaviours or both without using coercion or deception'.

According to Fogg (1998) persuasion can be accomplished by using the three functions of computers; as a tool, a medium or a social actor. All these functions of a computer can help to persuade people into changing their attitude or behaviour. In the last ten years more and more persuasive srategies are described and researched (B. Fogg, 2009). B.J. Fogg an authority on 'persuasive technology' from Stanford university has introduced various tools for analysing persuasive systems (B. Fogg, 2009b; Fogg, 2009a, 2009b; B. Fogg & Hreha, 2010; B. Fogg, 2009 a) and other researchers have also

contributed methods for designing persuasive systems. The difficulty with these proposed persuasive design methods is that some are often only theoretical and not tested in the application domain, for instance the method of Oinas-kukkonen and Harjumaa (2008). In a literature study of Torning and Oinas-Kukkonen (2009) the necessity comes forth for doing research on 'how to prescribe predictable persuasive designs and also methods for clearer measurement of successful designs'. On the basis of review of previous studies the following technologies are used as persuasive technologies to reach the desired behavior:

- Virtual Learning Environment.
- Facebook.
- 3D application.
- WEB 2.0
- EuroPLOT.
- Application developed in the HANDS project.
- Games based on occupational therapy, conversation counseling and simulated environment. (short messaging service)
- Persuasive Robberies for Education and Entertainment (PEERs).
- Virtual learning object
- Mobile application.
- Virtual Reality

A variety of approaches and tools, often based on different educational paradigms, may be used by the teachers in pursuit of these goals. The right type of persuasion could be Computer-Human and it could not. In this study WEB 2.0 and Mobile learning will be used as persuasive technologies in order to reach the desired change in the attitude and interest of students towards mathematics learning.

Based on the exploration of the field of investigation, the questions that came to light are as follows:

1). To what extent the implementation of PT in teaching-learning process is applicable in mathematics learning at secondary level?

2). Does the implementation of PT in teaching-learning process helps in developing a positive attitude among students towards mathematics learning?

3). Does the implementation of PT in teaching-learning process helps in developing interest of students towards mathematics learning?

2.1.0 ETHICAL ISSUES

There have been debates about potential ethical issues with persuasive technology design as the discipline has developed. Fogg (2003) addressed these early on, and argued that system designers should give due consideration to ethical issues.

Fogg's key argument is that persuasive applications are essentially ethical if the target behavior for the application is one that the target user would hold as a goal for themselves in any event. In other words, he draws a line between legitimate persuasion and manipulation. In compulsory schooling contexts this delineation is perhaps less clear, given that teachers may often give directions to children to undertake tasks that they don't want to do.

3.0.0 PROBLEM STATEMENT

Till now persuasion is used as a human to human to human communication. Nowadays as technology has built a strong rapport in the education field also, As Presnky (2008), Tapscott (2009) and Sprenger (2010) claimed that technology has changed the learning style of students.

It is the time to use the technology as persuasive tool and in order to persuade students towards the desired behavior. In this study the researcher will implement persuasive technology embedded platform in to the teaching-learning process for removing the negative attitude of students towards mathematical learning and for enhancing interest in mathematics.

Therefore the statement is : *Effect of Persuasive Technology Embedded Digital Platform on the Attitude and Interest of Secondary School Students Towards Mathematics Learning*

3.1.0 PURPOSE STATEMENT

The purpose of this study is to discover weather implementation of Persuasive Technology in teaching-learning process will be helpful in developing interest and positive attitude among students towards mathematics learning.

4.0.0 VARIABLES OF THE STUDY

The ***Independent Variable*** of the study is:

Persuasive Technology Embedded Digital Platform

The ***Dependent Variables*** of the study are:

1. Attitude Towards Mathematics Learning

2. Interest in Mathematics Learning

5.0.0 DEFINITION OF TERMS USED IN THIS STUDY

5.1.0 ATTITUDE TOWARDS MATHEMATICS LEARNING

According to Coleman(2006),'Attitude is an enduring pattern of evaluative responses towards a person, object or issue'.

Operational definition: In this study, Attitude involves a complex organization of evaluative beliefs, feelings, and tendencies towards mathematics subject.

5.2.0 INTEREST IN MATHEMATICS LEARNING

Jones (2010) states, 'Interest is a feeling of likening associated with a reaction, either actual or imagined to a specific thing or situation.'

Operational definition: In this study, Interest refers to the feeling of wanting to know or learn about something (mathematics subject) willingly with more attention and concentration.

5.3.0 PERSUASIVE TECHNOLOGY EMBEDDED DIGITAL PLATFORM

This variable consists of two concepts under which first one is *Persuasive Technology* and second one is *Digital Platform*. First we will define Persuasive Technology (PT) then Digital Platform. B.J. Fogg(2003) defined Persuasive Technology as technology, more specifically as interactive information technology, which is designed for intentionally changing the attitudes and/or behaviors of its users without deception or coercion.

Digital Platform is any electronic tool for communication includes desktop, mobile, social and email software this covers websites and social media like twitter, Amazon etc.

Operational definition: In this study, Persuasive Technology embedded digital platform is an electronic platform for presenting persuasive content (like Blogs, instructional material and videos sometimes SMS.) based on Persuasive Technology. This is in contrast to an analog platform (like billboards, direct mail, telemarketing, events, word-of-mouth, etc)

5.4.0 MATHEMATICS LEARNING

Operational definition: Mathematics learning refers to the acquisition of knowledge, skills, and cognitive abilities that are related to mathematics subject.

6.0.0 OBJECTIVES

Objectives of the present study are as follows:

1. To develop instructional material based on persuasive technology.

2. To upload the developed instructional material on the digital platform and implement the persuasive technology embedded platform in to the classroom.

3. To study the effect of Persuasive Technology on the attitude of students towards mathematics learning

4. To study the effect of Persuasive Technology on the interest of students in mathematics learning.

7.0.0 HYPOTHESES OF THE STUDY

To achieve the above objectives, the following hypotheses are formulated:

H_1: There will be a significant effect of Persuasive Technology on the attitude of students towards mathematics learning

H_2: There will be a significant effect of Persuasive Technology on the interest of students in mathematics learning.

8.0.0 PROCEDURE OF SAMPLING

The selection of the sample will be done by purposive sampling as the experiment required Mathematics stream students with a considerable strength. Targeted population will be of secondary level (class IX) students of state board/ CBSE board school. Number of sample units for school students will be 30.

9.0.0 EXTRANEOUS VARIABLES

The Extraneous Variables will be controlled as shown in the following table:

Category of Variables	Variables	Controlling techniques	Methods of controlling
Subject Related Variables	Age SES	Sample selection	Through Randomization
	Anxiety Motivation	Rapport establishment	By Researcher
Environment Related Variables	Classroom Climate	Rapport establishment	By Researcher
	Noise	Removed	Psychologically by Researcher
	Light Test time Test administration	Constancy	By Researcher
Sequence Related Variables	Practice	Eliminated	Psychologically by Researcher
	Fatigue	Eliminated	Psychologically by Researcher
	Cooperation	Constancy	By Researcher

10.0.0 METHODOLOGY

For the accomplishment of the objectives of the study the folloing methods will be used:

1). The present study made the use of Development-cum-Experimental method.

2). Single group Pretest-Post test design for determining effect of Persuasive Technology.

3). Quantitative methods for monitoring the progress of students.

11.0.0 RESEARCH DESIGN

Single group pre-test, post-test designs will be used in the present study which will be conducted in three phases:

Phase-1: Planning

Phase-2: Implementation

Phase-3: Evaluation

Phase I-Planning					
	Phase II- Implementation				Phase III Evaluation
Groups	**Pre-test**	**Treatment**			**Post-test**
		Sample	**Treatment**	**Duration**	
Experimental Group	**1-**Attitude Towards Mathematics Scale **2-** Interest Scale	N=30 School Students	Teaching Mathematics using Persuasive Technology Embedded Digital Platform	2 Months (60 days)	**1-**Attitude Towards Mathematics Scale **2-** Interest Scale

12.0.0 TOOLS OF THE STUDY

Instructional material will be prepared for 4 chapters by the researcher in traditional as well as on the basis of potential use of persuasive technology. Every mathematics lesson plan is planned for duration of 40 minutes from the U.P. Board curriculum of mathematics prescribed for class IX. In order to measure attitude and interest towards Mathematics, following tools will be used:

1. Attitude Towards Mathematics Scale(ATMS) by *S. C. Gakhar and Rajni*(2012).

2. Mathematics Interest Scale by *U.Tandon* & *Ashok Pal* (2016).

13.0.0 STEPS FOR DEVELOPING INSTRUCTIONAL MATERIAL

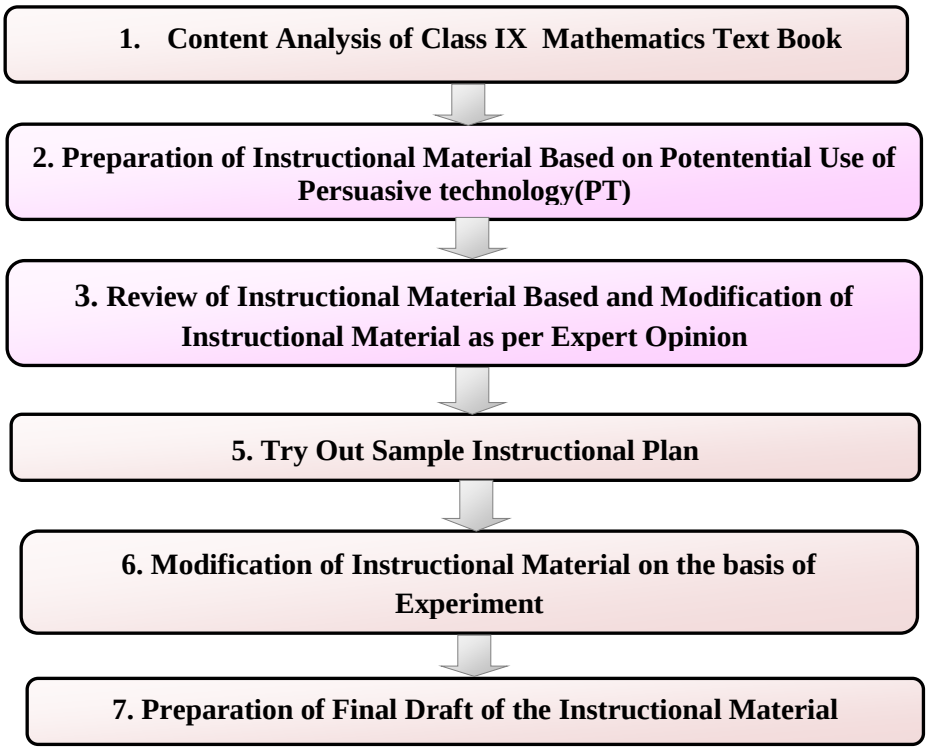
1. Content Analysis of Class IX Mathematics Text Book
2. Preparation of Instructional Material Based on Potentential Use of Persuasive technology(PT)
3. Review of Instructional Material Based and Modification of Instructional Material as per Expert Opinion
5. Try Out Sample Instructional Plan
6. Modification of Instructional Material on the basis of Experiment
7. Preparation of Final Draft of the Instructional Material

Fig 1.5: Steps for developing instructional material

14.0.0 STATISTICAL TECHNIQUES

The data will be analyzed in light of objectives of the study both qualitatively as well as quantitatively. Certain Descriptive and Inferential statistics will be used in order to describe the nature and distribution of the scores obtained on various tests.

This study will include following methods analysis:

Mean: Mean value will be calculated for the distribution of attitude scores, achievement scores and Science process skills scores.

Standard Deviation: It will be calculated to study the variation in the scores.

T-test: Inferential Statistics techniques such as t-test will be employed for testing significance of the difference between the experimental and control group on the bases of pre-test, post-test scores.

15.0.0 SIGNIFICANCE OF THE STUDY

The emerging sub-discipline of Persuasive technology offers an opportunity to assess how a focus on persuasion and persuasive design can potentially be effective in bringing about behavior change in educational settings. According to Brian J. Fogg (2002), PTs can be used at school or external environments to motivate people to acquire new knowledge or skills. In addition, PTs can motivate individuals to start certain process of learning, tasks, review when necessary materials as well as to continue the particular activity. In his book *Persuasive technology: using computers to change what we think and do*, B.J. Fogg(2002), presented six advantages of computational persuasion agents:

(1) Persistence: no human being can be as persistent as a machine that does not get tired, nor frustrated with a refusal.

(2) Anonymity: it is easier to obtain information anonymously through an interactive computer program than to another human being.

(3) The ability of computers to store, access, and manipulate data that goes far beyond human capacity, which gives interactive technology the potential to be more persuasive than people.

(4) Ability to use multiple media modes at the same time.

(5) Ability to scale rapidly.

(6) Ability to be in most places, their ubiquity.

A variety of approaches and tools, often based on different educational paradigms, may be used by the teacher in pursuit of these goals. The right type of persuasion could be Computer-Human and it could not. Thus Issues of social context, power relations, and the combination of different pedagogical tools potentially including persuasive technology need, therefore, to be considered when applying persuasive technology design to educational contexts.

The introduction of this new technology in the classroom introduces new opportunities for education. If teachers encountering persuasive technology as a new tool in the classroom are to effectively assimilate it, it is necessary to consider how it relates to existing educational paradigms and how it may offer something innovative to teachers. The use of appropriate interactive technology can enhance learner's cognitive and social abilities.

This technology attracts the learner's attention in term of meaningful learning, self-explored and retention in content understanding which helps the learners to integrate information more efficiently. The findings of the study will be helpful in the selection of right type teaching tools for teaching mathematics in secondary schools. Students will actively participate in the learning process. Along with active participation this method will help in improving their thinking capacity and academic achievement in mathematics subject.

Students will be able to develop mathematics skills as well as their inellectual skills. As persuasive technology followed in this study, it will be beneficial for slow learners also as the anywhere, anytime technology involed with it. It will help the students to learn with their pace. It will help students by allowing them to learn by their own pace.

This method of learning will help in making classroom environment alive. Along with this it was help in attracting student's attention. This will help teachers in making their students learn about the basic concepts as teacher provides proper opportunity with instruction to perform different activities. This study will be helpul for the curriculm developers also as the results of this study will suggest that how persuasive content can be benificial for the students in devloping positive attitude and interest among the students towards the subject.

16.0.0 DELIMITATIONS

1. The participants will be from Agra city only.
2. The selected school will be affiliated to either UP board or CBSE board only.
3. The study will be limited to class IX mathematics subject only.
4. In this study WEB 2.0 and M-Learning will be used as persuasive technology tools
5. The duration for treatment will be 60 days.
6. The analysis of the study will be based on the data provided by the appropriate tools only.

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